What is claimed is:

1. An arrangement for generating a digital current measurement signal, comprising:

an analog to digital converter operably to receive voltage input signal and generate a digital output signal having a digital value representative of the magnitude of the voltage input signal; and

an impedance circuit having at least first and second alternative impedance values and a switch operable to cause the impedance circuit to have a select one of the first impedance value and the second impedance value, the impedance circuit connected to receive a current signal to be digitized, the impedance circuit generating an output voltage signal representative of the current signal and having a magnitude dependent on the select one of the first impedance value and the second impedance value, the output voltage signal constituting the voltage input signal of the A/D converter.

2. The arrangement of claim 1 wherein the A/D converter is a sigma-delta converter.

3. The arrangement of claim 1 wherein the A/D converter is a successive approximation converter.

4. The arrangement of claim 1 further comprising a control circuit operable to obtain current magnitude information from the digital output signal, the control circuit further operable to control operation of the switch of the impedance circuit based on the current magnitude information.

5. The arrangement of claim 4 wherein the control circuit is further operable to cause the switch to select the first impedance level when the current magnitude information is representative of a current magnitude that exceeds a first threshold.

6. The arrangement of claim 5 wherein the control circuit is further operable to cause the switch to select the second impedance level when the current magnitude information is representative of a current magnitude that is below a second threshold.

7. The arrangement of claim 6 wherein the first threshold is different than to the second threshold.

8. The arrangement of claim 1 wherein the impedance circuit is a passive impedance circuit.

9. The arrangement of claim 8 wherein the impedance circuit includes first and second parallel resistors, the second parallel resistor coupled to the switch such that the switch selectively connects and disconnects the second parallel resistor.

10. The arrangement of claim 9 wherein the impedance circuit includes a third parallel resistor.

11. The arrangement of claim 10 further comprising a fourth resistor, the first, third and fourth resistors forming a pi attenuation circuit.

12. The arrangement of claim 9 wherein the first resistor, the second resistor and the switch are formed on a single semiconductor substrate.

13. An impedance circuit configured to be connected to receive a current to be converted to a voltage, the impedance circuit comprising a first output resistor and a second parallel output resistor, the second parallel output resistor connected to a switch operable to to selectively connect and disconnect the second parallel output resistor.

14. The impedance circuit of claim 13 wherein the first output resistor, the second parallel output resistor, and the switch are all formed on a single semiconductor substrate.

15. The impedance circuit of claim 14, wherein the switch comprises a MOSFET transistor.

16. The impedance circuit of claim 13, further comprising a third parallel output resistor and a fourth resistor connected between the first parallel output resistor and the third parallel output resistor.

17. An impedance circuit for an electrical meter monitoring power usage from a service line, the meter having a current meter and a transformer having a conductor of the service line coupled to primary terminals and a sensing resistor coupled across secondary terminals, the impedance circuit comprising:

a signal generator generating a control signal having a level dependent upon the current sensed by the current meter;

an electrically controlled switch having an ON state and an OFF state, the state of said switch being dependent upon the level of the control signal;

a resistive branch including the electrically controlled switch and a resistive element;

wherein the impedance circuit couples the sensing resistor to the current meter and wherein the equivalent resistance seen by the current meter is dependent upon the state of the switch.

18. The impedance circuit of claim 17 wherein the switch is a transistor.

19. The impedance circuit of claim 17 wherein the resistive branch includes a resistor with a temperature coefficient within 0.05% of the temperature coefficient of the sensing resistor.

20. The impedance circuit of claim 17 wherein the resistive branch is in parallel with the sensing resistor when the switch is in the ON state.

21. The impedance circuit of claim 17 and further comprising a plurality of resistors in series constituting a voltage divider in parallel with the sensing resistor and the current meter is coupled across terminals of one resistor of the voltage divider.

22. The impedance circuit of claim 21 wherein the resistive branch is in parallel with the one resistor of the voltage divider.